# Brocade 8Gb FC Single-port and Dual-port HBA for IBM System x

## IBM System x at-a-glance guide

The Brocade 8Gb FC Single-port and Dual-port HBA for IBM System x are PCI Express 2.0 x8 8Gb Fibre Channel adapters with SFP+ LC-style connectors. The adapters connect to SFP+ Multimode Fiber SR optical modules. These adapters support 8 Gbps per port maximum bidirectional throughput for high-bandwidth storage (SAN). The PCI Express low profile form factor adapter can be used in either a standard PCI Express slot or a low profile PCI Express slot.

Figure 1 shows the single-port and dual-port adapters.

Figure 1. Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x (with 2U bracket attached)

## Did You Know?

Brocade 8Gb HBAs enable end-to-end SAN Solutions using 8 Gb Fibre Channel technology for System x servers. They provide the ability to build high-performance, highly available SANs and are easy to set up and integrate into existing SAN configurations.

For local or remote management, Brocade provides Host Connectivity Manager (HCM) native GUI and CLI tools to configure and monitor its HBAs. In addition, Brocade DataCenter Fabric Manager (DCFM) provides unified, end-to-end management across fabrics with Brocade Fibre Channel switches and HBAs. Both DCFM and HCM provide open APIs and standards-based interfaces for integration with popular third-party applications and higher-level frameworks to help orchestrate Brocade hardware and SAN services.

## Part number information

Table 1. Ordering part numbers and feature codes

| Description | Part number | Feature code |
|---|---|---|
| Brocade 8Gb FC Single-port HBA for IBM System x | 46M6049 | 3589 |
| Brocade 8Gb FC Dual-port HBA for IBM System x | 46M6050 | 3591 |

The part numbers for the Brocade 8Gb FC Single-port and Dual-port HBAs include the following items:

- FC HBA adapter with one or two SFPs installed and 3U bracket attached
- Quick install guide
- Support CD
- 2U bracket
- Safety flyer

## Features

The Brocade 8Gb FC Single-port and Dual-port HBAs have the following features:

- Function at 8/4/2 Gbps (auto-negotiation)
- Persistent binding
- 2,048 concurrent logins
- PCI Express 2.0 x8 compliance, with MSI-X and INTx
- One (for Single-port) and two (for Dual-port) SFP+ with LC-style connectors
- Standard PCI Express card with low profile MD2 form factor
- Support for both standard and low-profile PCI-E slots

## Specifications

The Brocade 8Gb FC Single-port and Dual-port HBAs have the following specifications:

- Data rate: 1600 MBps full duplex per port
- Performance: up to 500,000 IOPS per port
- Boot support: BIOS, UEFI, PCI BIOS 3.0
- Protocols: SCSI-FCP, FCP-2, FCP-3, FC-SP
- Standard supported: Enhanced Authentication (FC-SP), Network isolation (NPIV)
- Distance support: 50 meters at 8 Gbps on 62.5/125 µm Multi-Mode Fiber (MMF)

## Physical specifications

The Brocade 8Gb FC Single-port and Dual-port HBAs have the following physical specifications:

- Height: 68 mm (2.7 in)
- Width: 167 mm (6.6 in)
- Depth: 18 mm (0.7 in)
- Weight: 127 g (0.28 lb)

## Operating environment

The adapter is supported in the following environment:

- Temperature:
  - Operating: 0° to 55°C (32° to 131°F) at 0 to 914 m (0 to 3,000 ft)
  - Storage: -43° to 73°C (-40° to 163°F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Relative humidity:
  - Operating: 5% to 93% (relative, non-condensing)
  - Non-operating: 5% to 95% (relative, non-condensing)

## Warranty

One-year limited warranty. When installed in a System x server, these cards assume the system's base warranty and any IBM ServicePac upgrade.

## Supported servers

The Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x are supported in the IBM System x servers listed in Table 2.

Table 2. Supported servers

| Adapter | x3200 M2 | x3250 M2 | x3350 | x3400 | x3400 M2 | x3450 | x3455 | x3500 | x3500 M2 | x3550 | x3550 M2 | x3650 | x3650 T | x3650 M2 | x3655 | x3755 | x3850 M2 | x3950 M2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brocade 8Gb FC Single-port HBA | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Y |
| Brocade 8Gb FC Dual-port HBAs | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Y |

See IBM ServerProven for the latest information on the adapters supported by each System x server type: http://ibm.com/servers/eserver/serverproven/compat/us/.

## Popular configurations

This section illustrates how the Brocade 8Gb FC Single-port and Dual-port HBAs can be used in configurations.

Figure 2 shows the Brocade 8Gb FC Dual-port HBAs installed in a supported x3650 M2 server. The server is connected to the IBM System Storage DS3400.

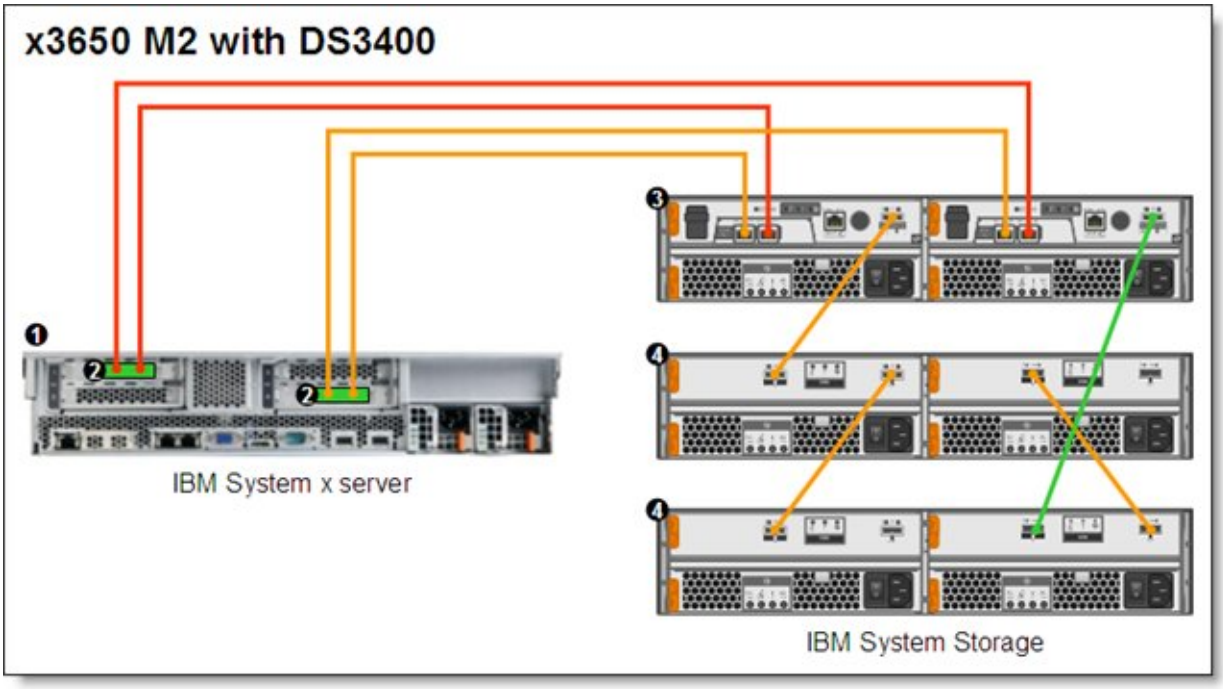


Figure 2. x3650 M2 server connected to an external IBM System Storage DS3400 storage solution

The parts used are listed in Table 3.

Table 3. Components used when connecting Brocade 8Gb FC Dual-port HBA to external disk storage (as shown in Figure 2)

| Diagram reference | Part number/machine type | Description | Quantity |
|---|---|---|---|
| 1 | Varies | x3650 M2 or other supported server | 1 |
| 2 | 46M6050 | Brocade 8Gb FC Dual-port HBA | 2 per server |
| 3 | 1726-41X or 1726-42X | IBM System Storage DS3400 (Single or Dual Controller) | 1 |
| 4 | 1727 | **Optional** IBM System Storage EXP3000 (Single or Dual ESM) | 1 to 3 |

This configuration also requires cabling between the server and the storage and between the storage server and expansion units. (The cable part numbers are not listed in Table 3.)

Figure 3 shows the Brocade 8Gb FC Single-port HBAs installed in a supported x3650 M2 server. The servers are connected to the IBM System Storage DS4700 via IBM System Storage SAN24B-4 switches and form 2-node cluster solution.

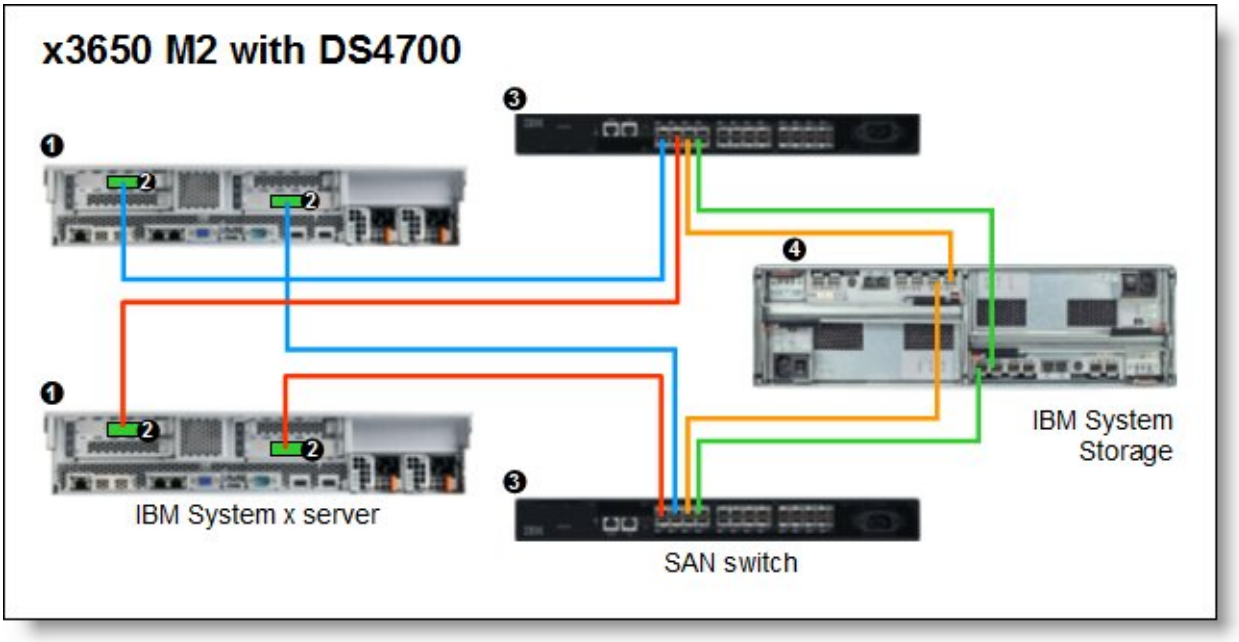


Figure 3. x3650 M2 server connected to an external IBM System Storage DS4700 via SAN switches

The parts used are listed in Table 4.

Table 4. Components used when connecting Brocade 8Gb FC Single-port HBA to external disk storage (as shown in Figure 3)

| Diagram reference | Part number/machine type | Description | Quantity |
|---|---|---|---|
| 1 | Varies | x3650 M2 or other supported server | 1 |
| 2 | 46M6049 | Brocade 8Gb FC Single-port HBA | 2 per server |
| 3 | Varies | IBM System Storage SAN24B-4 or other SAN switch | 2 |
| 4 | 1814-70A or 1814-70H | IBM System Storage DS4700 (Model 70 or Model 72) | 1 |

This configuration also requires cabling between the servers and the SAN switches and between the SAN switches and storage system. (The cable part numbers are not listed in Table 4.)

## Supported operating systems

The Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x support the following operating systems:

- Microsoft Windows Server 2003, Web Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter x64 Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise x64 Edition
- Microsoft Windows Server 2003/2003 R2, Standard Edition
- Microsoft Windows Server 2003/2003 R2, Standard x64 Edition
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Small Business Server 2003/2003 R2 Premium Edition
- Microsoft Windows Small Business Server 2003/2003 R2 Standard Edition
- Red Hat Enterprise Linux 4 AS for AMD64/EM64T
- Red Hat Enterprise Linux 4 AS for x86
- Red Hat Enterprise Linux 4 ES for AMD64/EM64T
- Red Hat Enterprise Linux 4 ES for x86
- Red Hat Enterprise Linux 4 WS/HPC for AMD64/EM64T
- Red Hat Enterprise Linux 4 WS/HPC for x86
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- SUSE LINUX Enterprise Server 9 for AMD64/EM64T
- SUSE LINUX Enterprise Server 9 for x86
- VMware ESX 3.5

See IBM ServerProven for the latest information about the specific versions and service packs supported: http://ibm.com/servers/eserver/serverproven/compat/us/. Click **System x servers**, and then click **Shared storage adapters** to see the support matrix. Click the check mark associated with the System x server in question to see the details of operating system support.

## Related publications

For more information, refer to these documents:

- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x Data Sheet
  ftp://ftp.software.ibm.com/common/ssi/pm/sp/n/xsd03039usen/XSD03039USEN.PDF
- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x Quick Installation and User's Guides
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5079304
- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x Quick Installation Guide
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5079305
- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x Technical overview
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5079091
- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x product page
  http://www.ibm.com/systems/storage/product/systemx/hba/8gbpcie.html
- IBM US Announcement Letter for the Brocade 8Gb FC Single-port and Dual-port HBAs
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS109-076
- IBM System x Configuration and Options Guide
  http://www.ibm.com/support/docview.wss?uid=psg1SCOD-3ZVQ5W
- Brocade 8Gb FC Single-port and Dual-port HBAs for IBM System x driver download page
  http://www.brocade.com/sites/dotcom/services-support/drivers-downloads/HBA/HBA_IBM.page

# Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service. IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing, IBM Corporation, North Castle Drive, Armonk, NY 10504-1785 U.S.A.*

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you. This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

**© Copyright International Business Machines Corporation 2009. All rights reserved.**
Note to U.S. Government Users Restricted Rights -- Use, duplication or disclosure restricted by
GSA ADP Schedule Contract with IBM Corp.

This document was created or updated on July 31, 2009.

Send us your comments in one of the following ways:

- Use the online **Contact us** review form found at:
  ibm.com/redbooks
- Send your comments in an e-mail to:
  redbook@us.ibm.com
- Mail your comments to:
  IBM Corporation, International Technical Support Organization
  Dept. HYTD Mail Station P099
  2455 South Road
  Poughkeepsie, NY 12601-5400 U.S.A.

This document is available online at http://www.ibm.com/redbooks/abstracts/tips0719.html .

# Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. These and other IBM trademarked terms may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at http://www.ibm.com/legal/copytrade.shtml

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

IBM®
Redbooks (logo)®
ServerProven®
ServicePac®
System Storage™
System x®

The following terms are trademarks of other companies:

Brocade and the Brocade B-wing symbol are trademarks or registered trademarks of Brocade Communications Systems, Inc., in the United States and other countries.

SUSE, the Novell logo, and the N logo are registered trademarks of Novell, Inc. in the United States and other countries.

Red Hat, and the Shadowman logo are trademarks or registered trademarks of Red Hat, Inc. in the U.S. and other countries.

VMware, the VMware "boxes" logo and design are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions.

Microsoft, Windows Server, Windows, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.